CleanPower Turbinator®

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Content

- CleanPower AS background
- The Turbinator®
- Projects

CleanPower AS background

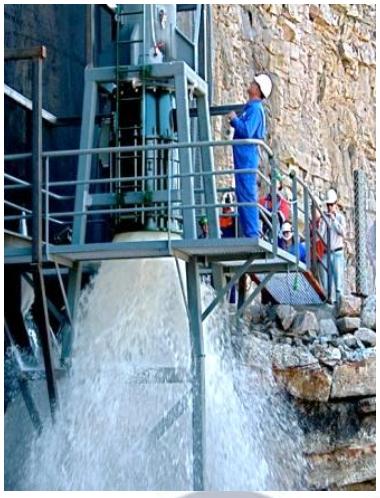
Brunvoll and Inpower:
Rim-driven thruster (PM motor)
pilot installation on ferry «Eiksund»

- Established 2005 i Kristiansund, Norway
- Spin-off from shipbuilding industry

Thruster technology

(Permanent Magnet based)

Hydropower turbine generator (also PM)



CleanPower turbine prototype test facility in Kristiansund, Norway

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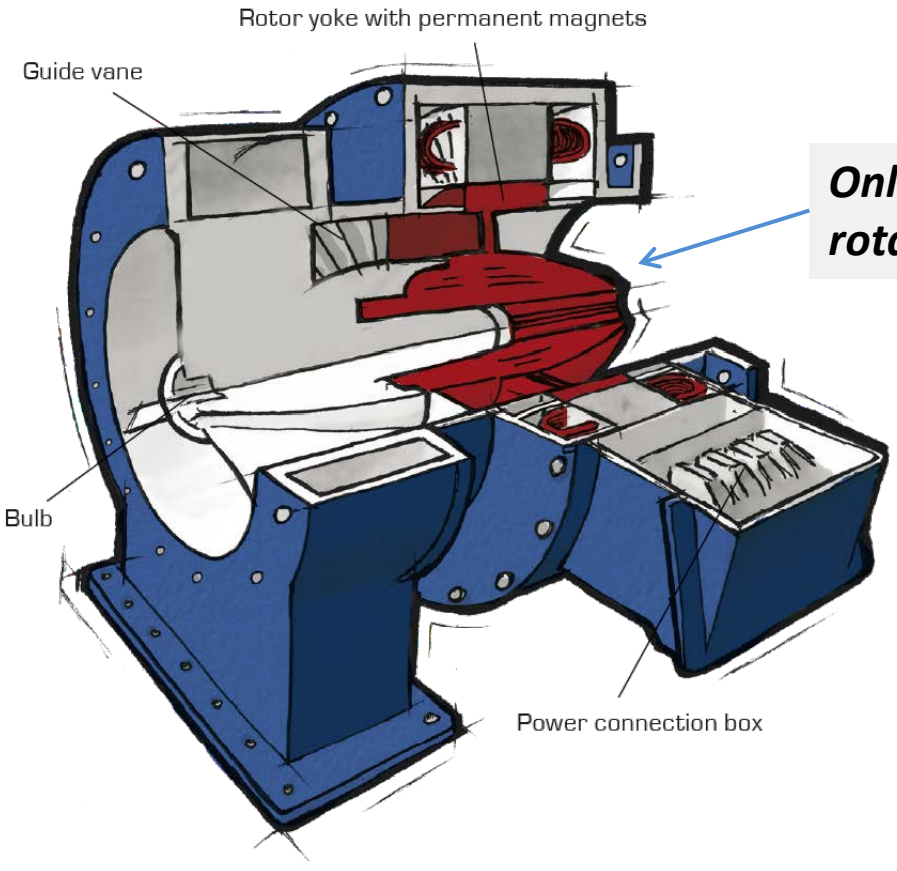
The Turbinator®

- Axial flow turbine
- Fixed runner blade pitch
- Adjustable guide vanes

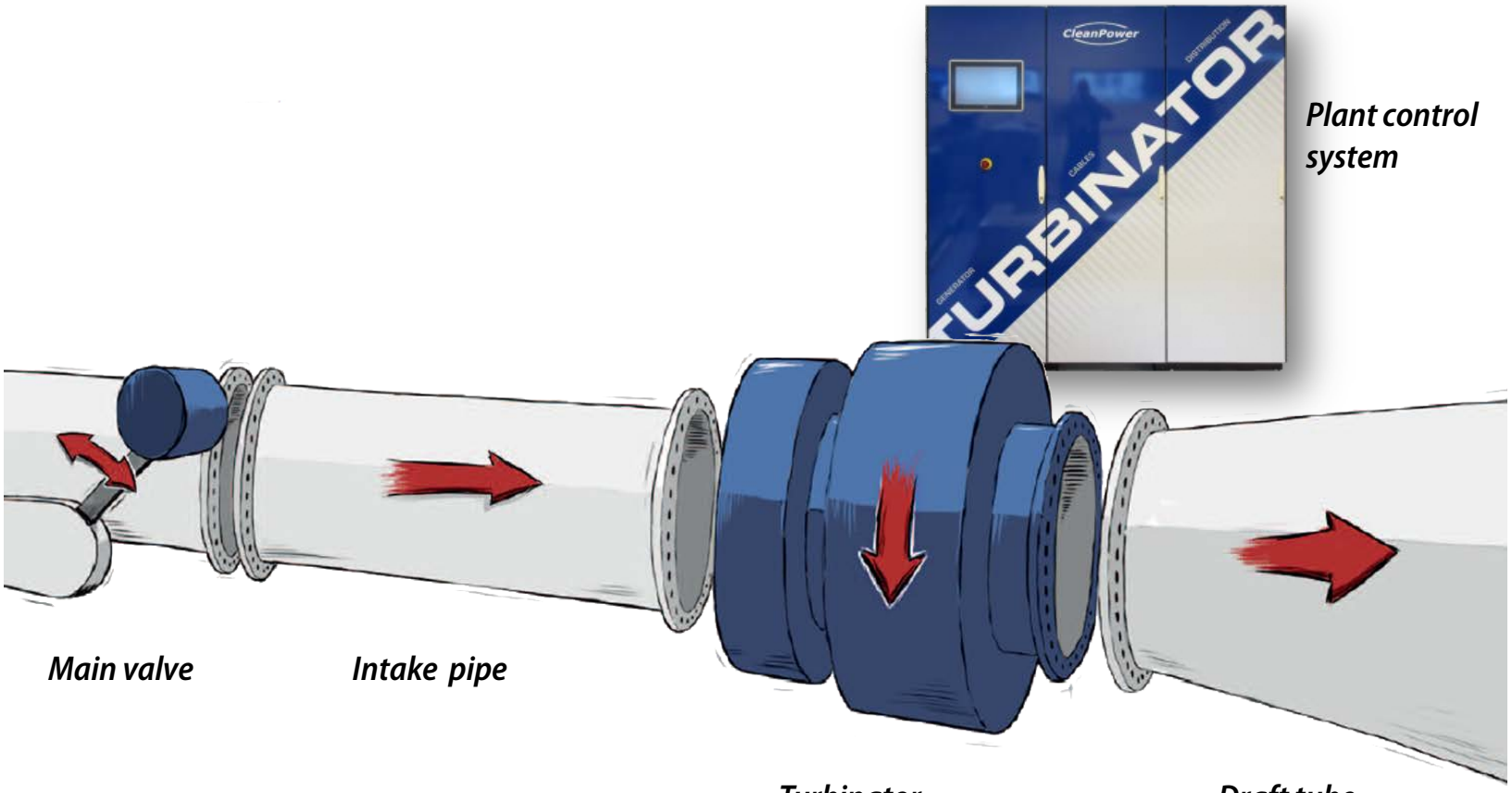
→ Single regulated Kaplan

- Integrated PM generator

Power	100 to 3000 kW
Head	15 - 180 ft
Flow	18 - 350 cfs
Efficiency	80 - 85% (turbine + generator)



Typical installation main components



Flange / flange installation

1…

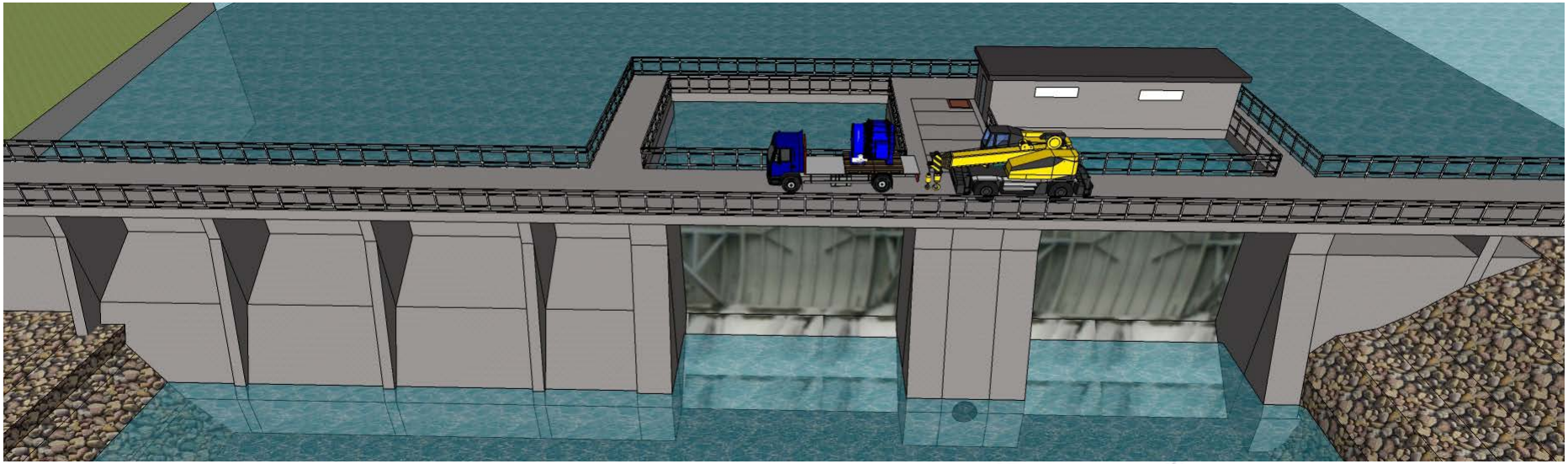
2…

3…!

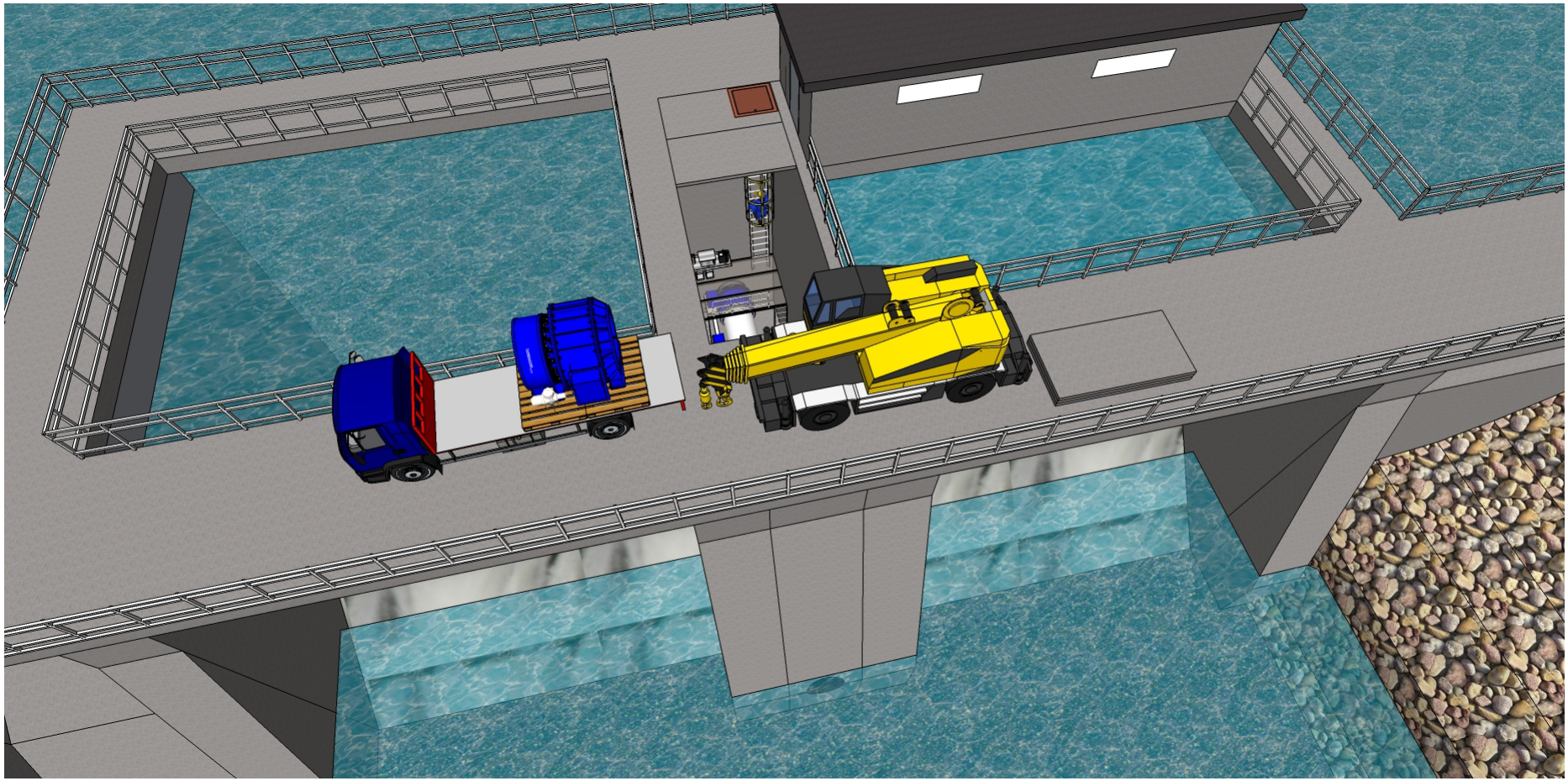
Simplified machinery
Simplified civil works
Short time to market
…and low LCOE (Levelized Cost Of Energy)

Applications

- Compact construction
- Well suited for hydropower energy recovery in existing infrastructure
  - Water supply
  - Irrigation systems
  - Hydropower plant environmental flows
- EEA grants program: ***Component 1***



Example: Environmental flow



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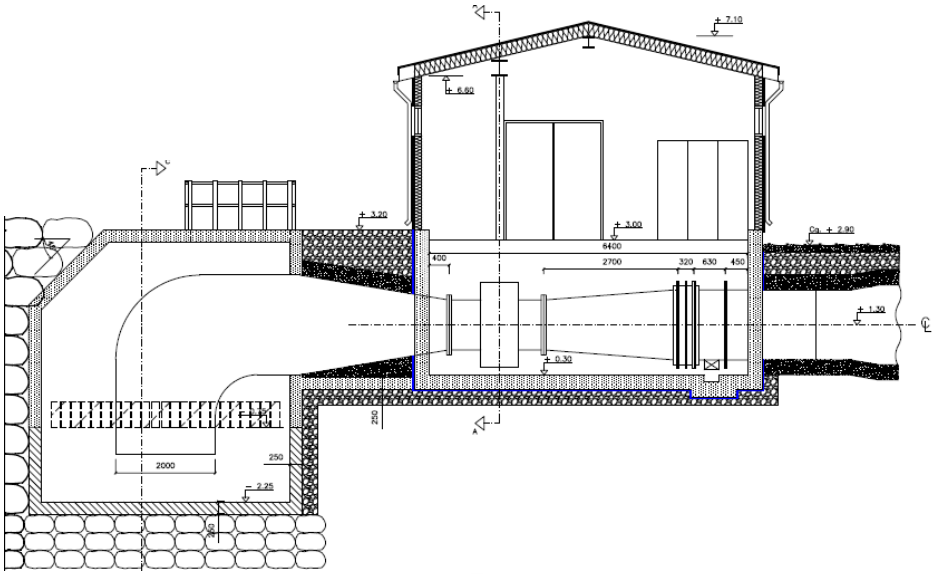
Pilot installation Hegset dam

- Environmental release
- Five month season: May - Sep
- Net head 24 m
- Flow 1.2 m^3/s
- Installed power 280 kW
- Seasonal production 0,8 GWh

Fully remote controlled

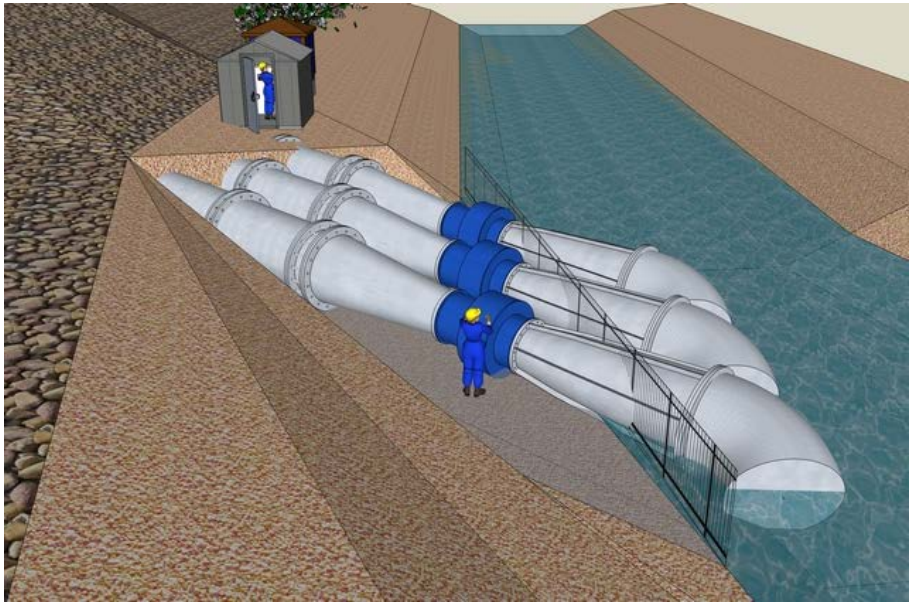
Tjeldbergodden power plant

- Energy recovery from methanol plant cooling water pumps
- Total project cost : EUR 1,5 million
- Annual production around 3 GWh



'45 Mile' project

- CleanPower will deliver three 1 MW Turbinators for the project '45 mile Hydro' on an irrigation canal in Oregon, USA
- The project receives 1.5 million USD grants from DoI / DoE



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